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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/661,658

09/12/2003

Jaime A. Pineda

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04/02/2007

PROCOPIO, CORY, HARGREAVES & SAVITCH LLP
530 B STREET
SUITE 2100
SAN DIEGO, CA 92101

EXAMINER

TOTH, KAREN E

ART UNIT

PAPER NUMBER

3735

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
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3 MONTHS

04/02/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/02/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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PTONotifications@procopio.com

Office Action Summary

Application No.

10/661,658

Applicant(s)

PINEDA ET AL.

Examiner

Karen E. Toth

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --.

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application
- ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 10-11 and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 10 and 22 are directed to "special algorithmic transformation of the EEG signal", while no description of what is meant by this is provided at any point in the application. Therefore, claim 10, claim 11, which depends from it, and claim 22 will not be further treated on their merits at this time.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 18 recites the limitation "the digitized bioelectric signal" in line 2. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the claim will be treated as reading "the EEG signal".

Claim Objections

5. Claims 13 and 25 are objected to because of the following informalities: The claims recite "BCI" but no definition of what the abbreviation stands for is present in the application. For examination purposes, this will be treated as an abbreviation for "brain/computer interface". Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 4, 5, 7, 15, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Knispel (US Patent 4883067).

Regarding claim 1, Knispel discloses a method comprising acquiring a plurality of bioelectric signals from an individual (column 9, lines 14-24); determining a cognitive-emotive profile of the individual based on the signals (column 3, lines 64-68; column 18, lines 36-43); and mapping the profile onto a set of commands for controllably delivering brain stimulation to the individual (column 3, lines 43-68; column 12, lines 54-56; column 14, lines 14-28; figure 9).

Regarding claim 4, Knispel further discloses that the bioelectric signal may be an EEG signal (column 9, lines 14-24).

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Regarding claim 5, Knispel further discloses that the EEG may be recorded from multiple sites on the individual's scalp (column 17, lines 27-32) using a portable headset (shown on user 1 with elements 3 and 11 in figure 1).

Regarding claim 7, Knispel further discloses decomposing the EEG signal into frequency domain subcomponents (column 4 line 61 to column 5 line 22), time domain subcomponents (column 9 line 43 to column 10 line 13), and spatial domain (column 9, lines 19-24; column 17, lines 26-32).

Regarding claim 8, Knispel further discloses the frequency domain subcomponents consisting of alpha and beta waves (column 17, lines 32-46).

Regarding claims 15 and 16, Knispel further discloses dynamically determining a cognitive-emotive profile that reflects changing behavior states (column 10, lines 13-18) and is comprised of sensorimotor and psychological states and their boundary conditions (column 19, lines 7-14).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title; if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 2, 3, 17-20, 23, and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knispel in view of Epstein (US Patent 6132361).

Regarding claims 2 and 3, Knispel discloses all the elements of the current application, as disclosed above, except for the brain stimulation being effected by transcranial magnetic stimulation (TMS) that is delivered to at least one site on a body. Epstein teaches a method of using TMS to provide brain stimulation feedback to an individual in response to measured emotive signals (column 1, lines 61-63; column 4, lines 15-22) to at least one site on the user's body (figure 3), since use of TMS to provide brain stimulation is well known in the art of cognitive-emotive studies. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have followed Knispel and used TMS to provide brain stimulation, as taught by Epstein, since use of TMS to provide brain stimulation is well known in the art of cognitive-emotive studies.

Regarding claim 17, Knispel discloses a system comprising means for acquiring an EEG signal from an individual (column 9, lines 14-24); means for determining a cognitive-emotive profile of the individual based on the EEGs (column 3, lines 64-68; column 18, lines 36-43); and means for controllably delivering brain stimulation to the individual in response to the cognitive-emotive profile (column 3, lines 43-68; column 10, lines 13-18; column 12, lines 54-56; column 14, lines 14-28; figure 9). Knispel does

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not disclose the brain stimulating feedback signal being in the form of TMS. Epstein teaches a method of using TMS to provide brain stimulation feedback to an individual in response to measured emotive signals (column 1, lines 61-63; column 4, lines 15-22), since use of TMS to provide brain stimulation is well known in the art of cognitive-emotive studies. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the system of Knispel and with TMS means for brain stimulation, as taught by Epstein, since use of TMS to provide brain stimulation is well known in the art of cognitive-emotive studies.

Regarding claims 18 and 19, Knispel further discloses decomposing the EEG signal into frequency domain subcomponents (column 4 line 61 to column 5 line 22), time domain subcomponents (column 9 line 43 to column 10 line 13), and spatial domain (column 9, lines 19-24; column 17, lines 26-32).

Regarding claim 20, Knispel further discloses the frequency domain subcomponents consisting of alpha and beta waves (column 17, lines 32-46).

Regarding claim 23, Knispel further discloses using Fast Fourier Transform (FFT) analysis to analyze the EEG signal (column 10, lines 30-31).

Regarding claim 27, Knispel further discloses the cognitive-emotive profile comprising sensorimotor and psychological states and their boundary conditions (column 19, lines 7-14).

Regarding claim 28, Knispel further discloses the system comprising feedback signal to control the amount of brain stimulation being delivered (column 3, lines 58-61).

Regarding claim 29, Knispel further discloses that the signal acquisition means comprises a sensor (element 3).

Regarding claims 30 and 31, Knispel further discloses the processor comprising a central processing unit (CPU) and software control program (column 10, lines 18-21).

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Knispel in view of Price (US Patent 6983184).

Regarding claim 6, Knispel discloses all the elements of the current invention, as described above, except for the portable headset including a matrix of EEG sensors and magnetic field coils oriented over specific areas of the individual's brain. Price teaches a method of applying brain stimulation in response to monitoring EEG signals using a portable headset with a matrix of EEG sensors (elements 2) and a magnetic coil (element 24) oriented over specific areas of an individual's brain (figure 1), in order to ensure accurate sensing and stimulation. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have followed Knispel and used a portable headset with a matrix of EEG sensors and a magnetic field coil oriented over specific areas of the individual's brain, as taught by Price, in order to ensure accurate sensing and stimulation.

Regarding claim 9, Knispel discloses all the elements of the current invention, as described above, except for the time domain subcomponents being selected from a group of event-related potentials (ERPs). Price teaches a method of applying brain stimulation in response to monitoring EEG signals that includes monitoring ERPs

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(column 10, lines 52-56), in order to ensure the reliability of the monitoring. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have followed Knispel and monitoring ERPs, as taught by Price, in order to ensure the reliability of the monitoring.

11. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knispel in view of DuRousseau (US Patent Application Publication 2002/0077534).

Regarding claims 12 and 13, Knispel discloses all the elements of the current invention, as disclosed above, except for identifying and classifying feature clusters from the plurality of EEG signal subcomponents. DuRousseau teaches a method of analyzing EEG signals comprising identifying and classifying feature clusters using fuzzy logic with a feature map (paragraphs [0011]-[0012], [0030], [0035]-[0036], [0044], [0047]), in order to accurately identify features within the signals. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have followed Knispel and identified and classified feature clusters from the EEG signal subcomponents using fuzzy logic to create a feature map, as taught by DuRousseau, in order to accurately identify features within the signals.

Regarding claim 14, DuRousseau further teaches using real-time pattern recognition to provide feedback instructions (paragraph [0049]), in order to modify the subject's brain activity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have followed Knispel in view of DuRousseau and used pattern recognition to provide feedback instructions, as taught by DuRousseau, in

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order to determine optimal brain stimulation (neural activation) to be provided, as taught by Knispel.

12. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Knispel in view of Epstein, as applied to claims 2, 3, 17-20, 23, and 27-31 above, and further in view of Price.

Regarding claim 21, Knispel in view of Epstein discloses all the elements of the current invention, as described above, except for the time domain subcomponents being selected from a group of event-related potentials (ERPs). Price teaches a system for applying brain stimulation in response to monitoring EEG signals that includes monitoring ERPs (column 10, lines 52-56), in order to ensure the reliability of the monitoring. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the system of Knispel and Epstein, and monitored ERPs, as taught by Price, in order to ensure the reliability of the monitoring.

13. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knispel in view of Epstein, as applied to claims 2-3, 17-20, 23, and 27-30 above, and further in view of DuRousseau.

Regarding claims 24 and 25, Knispel in view of Epstein discloses all the elements of the current invention, as disclosed above, except for identifying and classifying feature clusters from the plurality of EEG signal subcomponents.

DuRousseau teaches a system for analyzing EEG signals comprising identifying and

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classifying feature clusters using fuzzy logic with a feature map (paragraphs [0011]-[0012], [0030], [0035]-[0036], [0044], [0047]), in order to accurately identify features within the signals. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the system of Knispel and Epstein, and identified and classified feature clusters from the EEG signal subcomponents using fuzzy logic to create a feature map, as taught by DuRousseau, in order to accurately identify features within the signals.

Regarding claim 26, DuRousseau further teaches using real-time pattern recognition to provide feedback instructions (paragraph [0049]), in order to modify the subject's brain activity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have followed Knispel in view of Epstein and DuRousseau and used pattern recognition to provide feedback instructions, as taught by DuRousseau, in order to determine optimal brain stimulation (neural activation) to be provided, as taught by Knispel.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 4940453 to Cadwell, which discloses a similar method and system.

US Patent 4949726 to Hartzell, which discloses a similar method and system.

US Patent Application Publication 2005/0124848 to Holzner, which discloses a similar method and system.

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US Patent 6292688 to Patton, which discloses a similar method and system.

US Patent 5392788 to Hudspeth, which discloses a similar method and system.

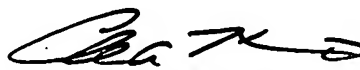
US Patent 6021346 to Ryu, which discloses a similar method and system.

US patent 6349231 to Musha, which discloses a similar method and system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karen E. Toth whose telephone number is 571-272-6824. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor, II can be reached on 571-272-4730. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


CHARLES A. MARMOR II
SUPERVISORY PATENT EXAMINER
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